# Leadership and Leading Indicators

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*Thanks to Matt Moury and Doug Minnema*

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# Objectives

- **A few thoughts about leadership**
- **Actions taken by leaders**
- **Role of leading indicators**
- **Consider the future**

# Safety Culture

**Safety culture** is an organization's values and behaviors – modeled by its leaders and internalized by its members – that serve to make nuclear safety an overriding priority.*

- Dating back to SEN-35-91, it's DOE Policy;
- It's perishable;
- EFCOG/DOE ISMS Safety Culture Task Team.

*INPO, *Principles for a Strong Nuclear Safety Culture*, November 2004.

# Leadership & Mission

Top 10 Ways To Know You Have A Safety Culture:

- #1 is Leadership - the talk and the walk
- #2 is Balanced Priorities (between mission and safety)

**Ref:** **Safety Culture (and ISM)**, *P. S. Winokur*, ISM Champions Workshop, Brookhaven National Laboratory, November 2007.

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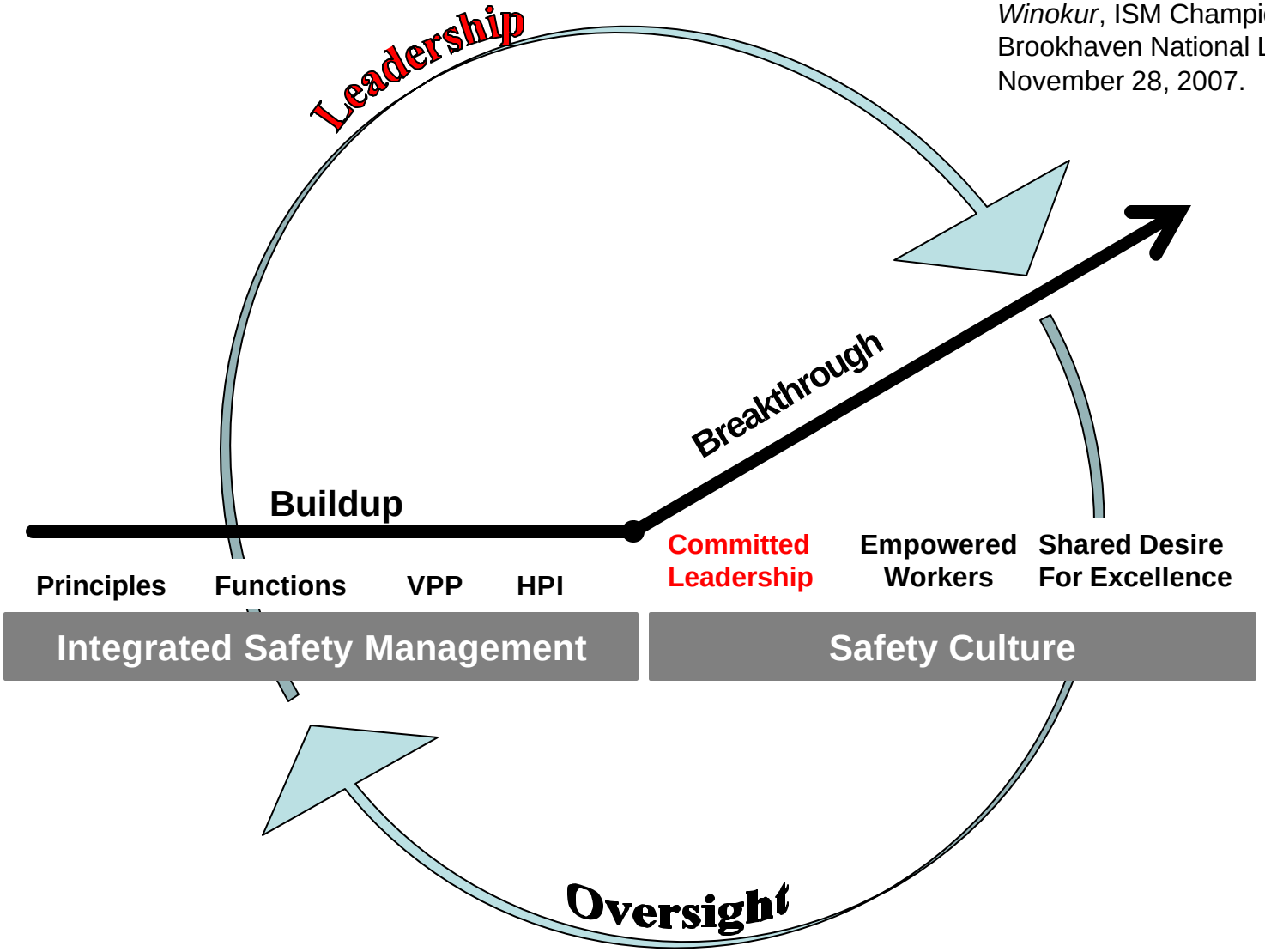



**Figure adopted from: Jim Collins, Good to Great; HarperCollins Publishers, NY; 2001.**

# Management vs. Leadership

"***Management is the process of assuring that the program and objectives of the organization are implemented.***

***"Leadership, on the other hand, has to do with casting vision and motivating people***." **John C. Maxwell**

# A Call for Leadership

**Sampling of recent Board-to-DOE letters found**

- **60% had safety culture-related issues**
- **58% had observations from multiple sites or activities**
- **Top five issues (in order):**
  - Failure to follow organization's own requirements
  - Inadequate resource prioritization or allocation
  - Ineffective or inadequate oversight
  - Inadequate justification for decision
  - Ineffective or incomplete corrective actions

# Leaders

- Decide the direction
- Set the example
- Drive the culture
- Develop the future leaders
- Anticipate the problems

***Build the future!***

***… for mission and safety***

# Leaders Decide the Direction

The direction in which an organization moves is based on more than just a stated goal

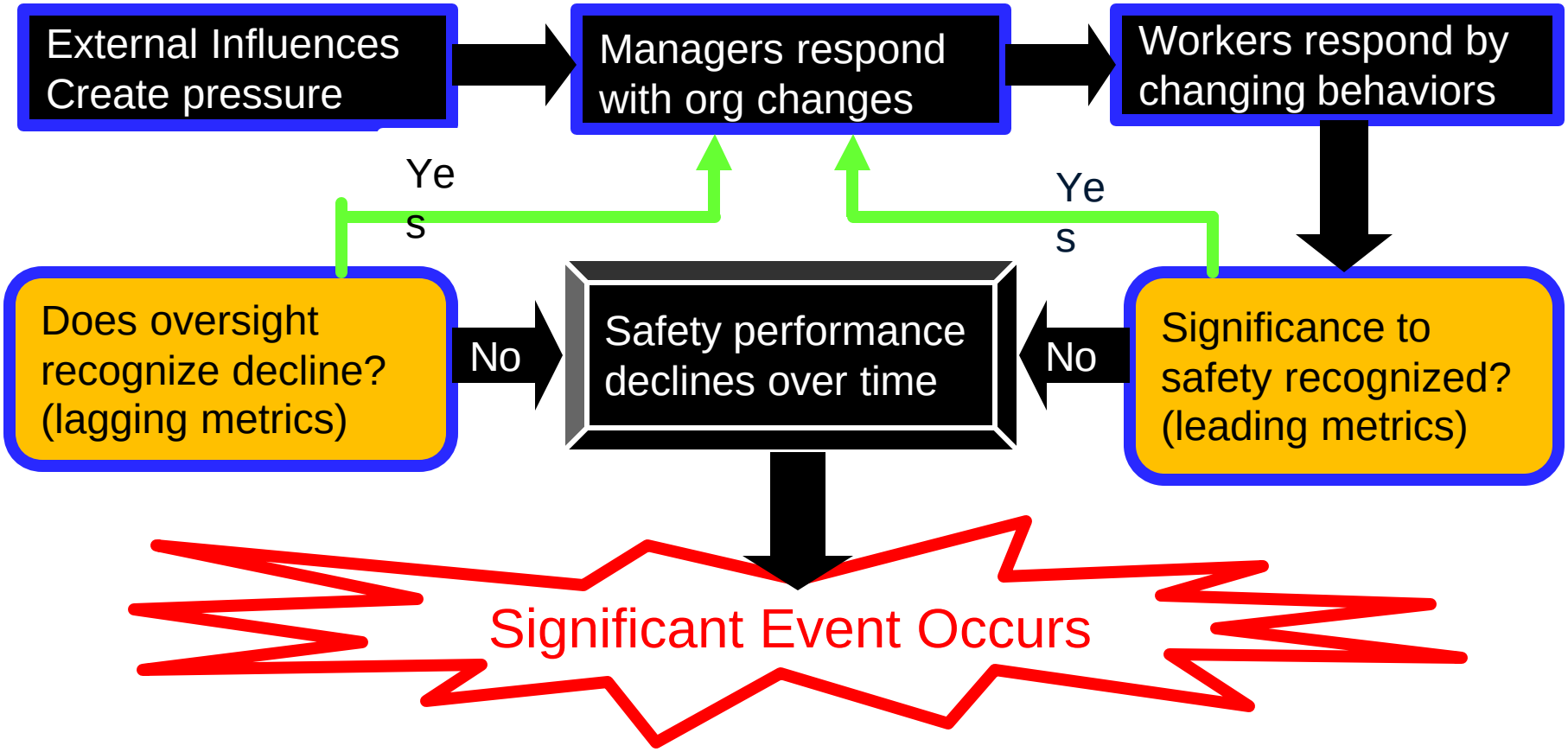
- Actions follow the words
- Proper resources are applied
- All are convinced of goal's importance
- Safety implications of changes are understood
- Conflicting goals are resolved
- Progress towards goal is measured as integral to continuous improvement (leading & lagging indicators, assessments, etc.)

***Pick good people and set the right priorities***

# Event Progression Model

**Improving Safety Culture;**
D Minnema, ISM Champions Workshop, BNL, 11/2007.

Organizational accidents often follow the same progression:




Feedback and Improvement is vital for safe and productive operations.

# Leaders Set the Example

- Demonstrate the values and behaviors they want the organization to follow.
- Safety is valued as the overriding priority – as good business.
- Understand their role in shaping culture and motivating workers
- Walk workspaces, solicit worker concerns and suggestions, and are personally involved in workers' training and work plans.
- Workers are confident that problems will be fixed in a timely manner; there is no fear of retaliation.
- The importance of identifying, evaluating, and fixing weaknesses, failures, and accident causal factors is emphasized loudly and often.

***"Leaders create culture. It is their responsibility to change it."***

**Columbia Accident Investigation Board**

# Leaders Develop Leaders

- Career development is encouraged and supported
- Involvement in professional societies is promoted
- Succession planning is expected and advancement pathways are clearly defined and communicated
- Hiring and promotion practices include consideration of safety attitudes and core values
- Team-building is integrated with training
- Leadership training is available and participation is expected as part of career development

***Leaders are made, not born.***

# Leaders Anticipate Problems

- There is great benefit in performing casual factors, root cause analyses, investigations, post-mortems, etc...
- But often corrective actions from these efforts fall short if not fully implemented and verified. Inadequate corrective actions are a frequent topic between the Board and DOE.
- But these efforts do not provide leading indicators.

**Leading indicators are proactive.**

# Anticipate Problems (cont)

**LAGGING INDICATORS** measure events that have already taken place and productivity.

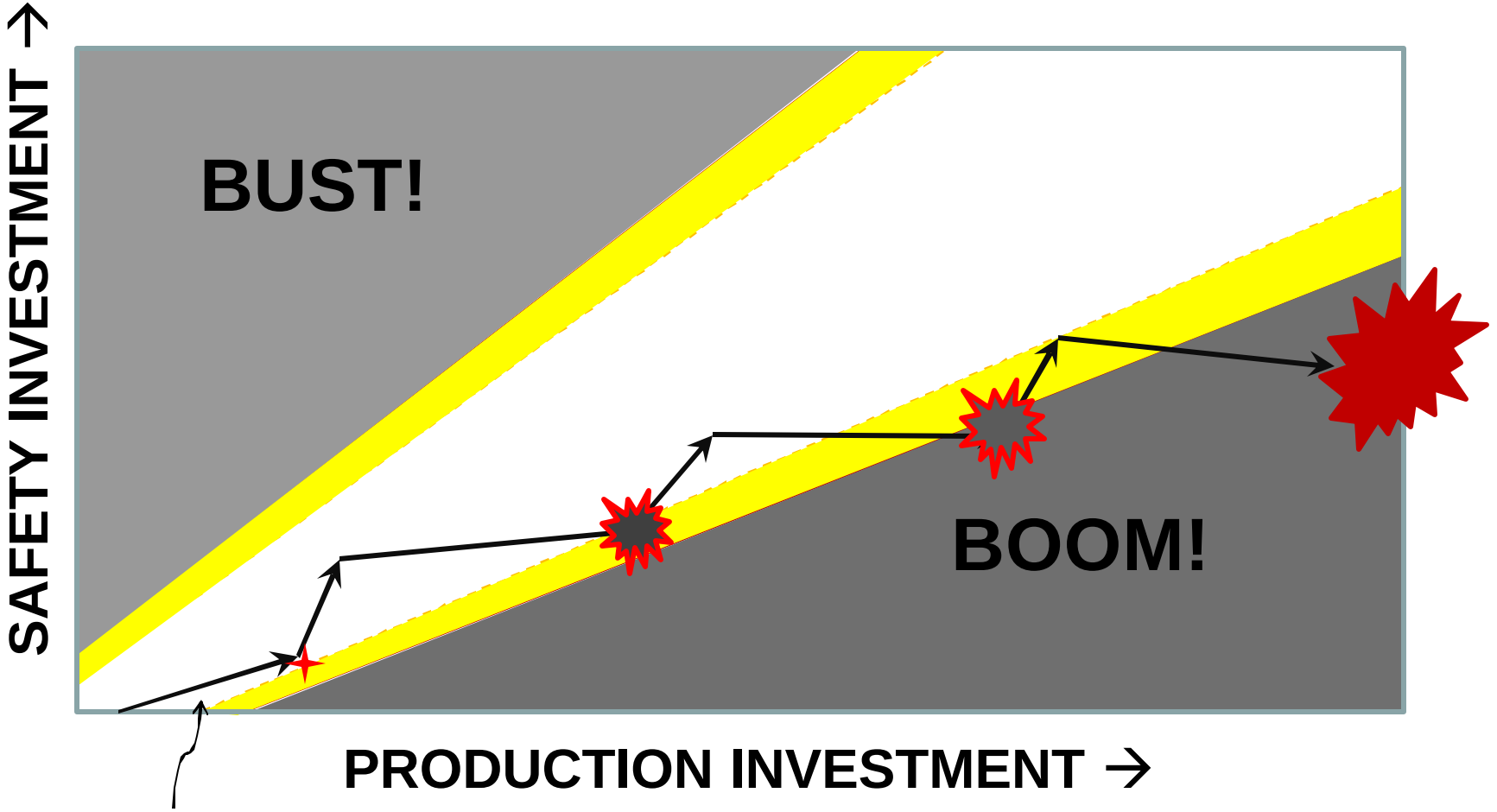
**LEADING INDICATORS** predict the likelihood of an event before it occurs and support productivity.

Some lagging indicators, when they occur repetitively or in certain combinations, can serve as leading indicators to more significant events.

Indicators will hopefully show positive trends.

# A Modified "Reason Model"

**(modified from Reason, 1997 and Starbuck, 1988)**




The slope and direction of this line is driven by the organization's desire to "economically optimize" the relative cost of safety in the activity. As safety deficit increases, slope may go negative, leading to more rapid degradation.

# 4-Step Process for Leading Indicators

1. Select a set of hierarchy of goals based on desired outcomes (link mission and safety).
2. Identify institutional and activity-specific safety programs that are key to meeting each goal; focus on the most critical components.
3. Determine metrics that best monitor the health of those key programs*; in the end, it's always people, processes, and equipment.*
4. Determine metrics that best monitor the status of the missions that are linked to the same goal.

# 4-Step Process (con't)

- The trends over time are more important than absolute values, and comparison between the mission and safety metrics are the key
- Interpreting the observed trends:

| | |
|---|---|
| Positive – | Safety Indicators improve faster than mission Indicators |
| Stable – | Equivalent improving trends |
| Negative – | Safety Indicators improving slower than mission Indicators |
| Danger – | Safety Indicators are declining |

# LANL Example
## Step 1 & 2: Goals & Key Programs

***LANL's Vision***: "Los Alamos, the premier national security science laboratory."

Currently there are 12 high-level goals, including

- "Make safety and security integral to every activity we do"
- "Provide efficient, responsive, and secure infrastructure"
- "Leverage our science …advantage to … meet national priorities"

Implied desired nuclear safety outcomes:

- No undue radiological releases to public or environment
- No criticality accidents
- No worker radiation doses above admin. control levels

Example programs essential to facility safety goals:

- Nuclear Facility Safety
- Radiation Protection
- Quality assurance
- Criticality Safety
- Formality of Operations
- Facility Maintenance

# LANL Dashboard Example

## Steps 3 & 4: Identify Metrics

Example Safety Indicators

- ST&E Cognizant System Eng. Staffing
- **Preventative Maintenance Completion**
- Mean Time to Repair Fire System Impairments
- **LIMTS Issues Resolved**
- Mean Time Between Significant Events
- Assessments Performing to Plan

Example Mission Indicators (for comparisons)

- Weapons Infrastructure Status
- ARIES Integrated Third Demonstration
- Weapons Program Commitment Issue Indicator
- Pu Oxide Polishing

# PANTEX Example

***Vision***: "Center of Excellence for assembly/disassembly of weapons."

–Pinnacle events to avoid:

- Worker fatality
- IND/HEVR
- Offsite release of SNM

– Initial leading indicators:

- TSR violations
- Nuclear safety system maintenance backlog
- Unplanned LCO entries
- Personnel trained and qualified as a percentage of staff on board
- Safety system availability

# Consider the Future

- **DOE cannot rely on past success; complacency is always a concern.**
- **Committed leadership drives safety culture**
  - Safety culture is measured by workers' behaviors
- **Leading indicators can be used to improve safety and productivity.**

  ***"Show me where it's working"*** **Peter Winokur**
- **Leading indicators can help monitor the balance between mission and safety.**
- **What's good for safety is what's good for business.**